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NEW INSECTICIDES TO BE TESTED
REACH RECORD BREAKING NUMBERS

The discovery during World War II of the insecticidal possibilities in a number of chemicals gave impetus to the search for new preparations for the control of insect pests. Industry, as well as the public, has become insect conscious, according to Dr. P. N. Annand, Chief of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, the nation's largest agency engaged in basic research on insecticides. Companies that never before manufactured insecticides are now entering the field, often as a side line, he says.

Recent research in Federal, State, and commercial laboratories has resulted in the development of many formulas for and methods of application of new compounds that can be recommended for general use in combatting insect pests in buildings, on farms and ranches, and in forests. More research is needed, however, before Federal and State agencies can comply with all the requests submitted to them for official approval of new combinations of chemicals and their use against a large number of crop insect pests. Today's demands from industry and the public for such approval has reached an all-time high, Dr. Annand says. Patience, he adds, is essential in obtaining this approval. The chemists engaged in the task often must devise new methods of analysis and the entomologists must make exhaustive tests with various insects before reaching a conclusion that would justify the introduction of the new insecticidal material. The questions to be answered by the research cover a very wide field.

The first fact to be proved about any new insecticide, of course, is that it will kill an insect. This is relatively simple, but also relatively unimportant. The important, and much more difficult, problem is to determine whether or not it will kill insects under various conditions. This involves such questions as: What is the toxicity of the candidate insecticide as compared with that of others now used for the same purpose? Against what stages of the insect's life cycle - egg, pupal, larval, or adult - is it effective? Is it a stomach or a contact poison? How can it be applied best - as a dust, a spray, or an aerosol? Can it be applied with standard equipment, or must new equipment be devised? Is it compatible with other insecticides, solvents, carriers, or fungicides? At what strength should it be applied? At what dosage per acre? How often? Will it injure plants when applied either to the foliage or the soil? What plants? Is it toxic to man or domestic animals? Acutely or chronically? Internally or externally? What is its effect on birds, fish, and other wildlife? On pollinating insects? On beneficial insects, such as parasites and predators that destroy insect pests? In what quantities is it toxic to these forms of life? Can it give effective

control without leaving toxic residues? If not, how can these residues be removed? Does the material enter the plant? If so, to what extent? How do conditions at the time of application affect results? Is effectiveness dependent on a certain range of temperature or humidity? Is there a regional variation in its effectiveness? Are the results of its use consistent? How does it compare with other insecticides in effectiveness, availability, cost, ease of application, and safety to plants, animals, and operators?

The answers to most of these questions must be found before general recommendations can be made by the Department of Agriculture that an insecticide be used by the public against many important pests. These pictures show some of the research on the new insecticides now under way in the Department's laboratories.

